Top Secret

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DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

Basic Imagery Interpretation Report

Munchon Nonferrous Metals Plant

Munchon, North Korea

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DATE NOVEMBER 1969

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
Imagery Analysis Service

INSTALLATION OR ACTIVITY NAME		COUNTRY
Munchon Nonferrous Metals Plant		KN
UTM COORDINATES	GEOGRAPHIC COORDINATES	25X1
52SCU587457	39-15-17N 127-21-41E	
MAP REFERENCE		
548th RTG, USATC, Series 200, Sheet M0380-4HL, 4th ed., Apr. 68, Scale 1:200,000 (SECRET/		25X1
LATEST IMAGERY USED	NEGATION DATE (If required)	
	N/A	25X1

ABSTRACT

Analysis of the Munchon Nonferrous Metals Plant in North Korea on high-resolution photography reveals that the primary products of the plant are refined zinc, refined lead, and lead bullion. Secondary products are zinc oxide, sulfuric acid, and precious metals such as gold and silver.

This study covers the period from November 1962 to June 1969. In November 1962, the plant contained facilities for the production of refined zinc, refined lead, lead bullion, sulfuric acid, and precious metals. By September 1964, an additional sulfuric acid facility, a zinc oxide facility, and numerous support facilities had been added. Between January 1966 and June 1969 a third sulfuric acid facility was added. Expansion of the zinc production area has continued at a steady pace since November 1962, and construction activity was still observed in June 1969. The production facilities were observed in operation on all of the photography utilized.

This report includes a photograph and a detailed line drawing of the plant, and a chronological summary of construction and operational status.

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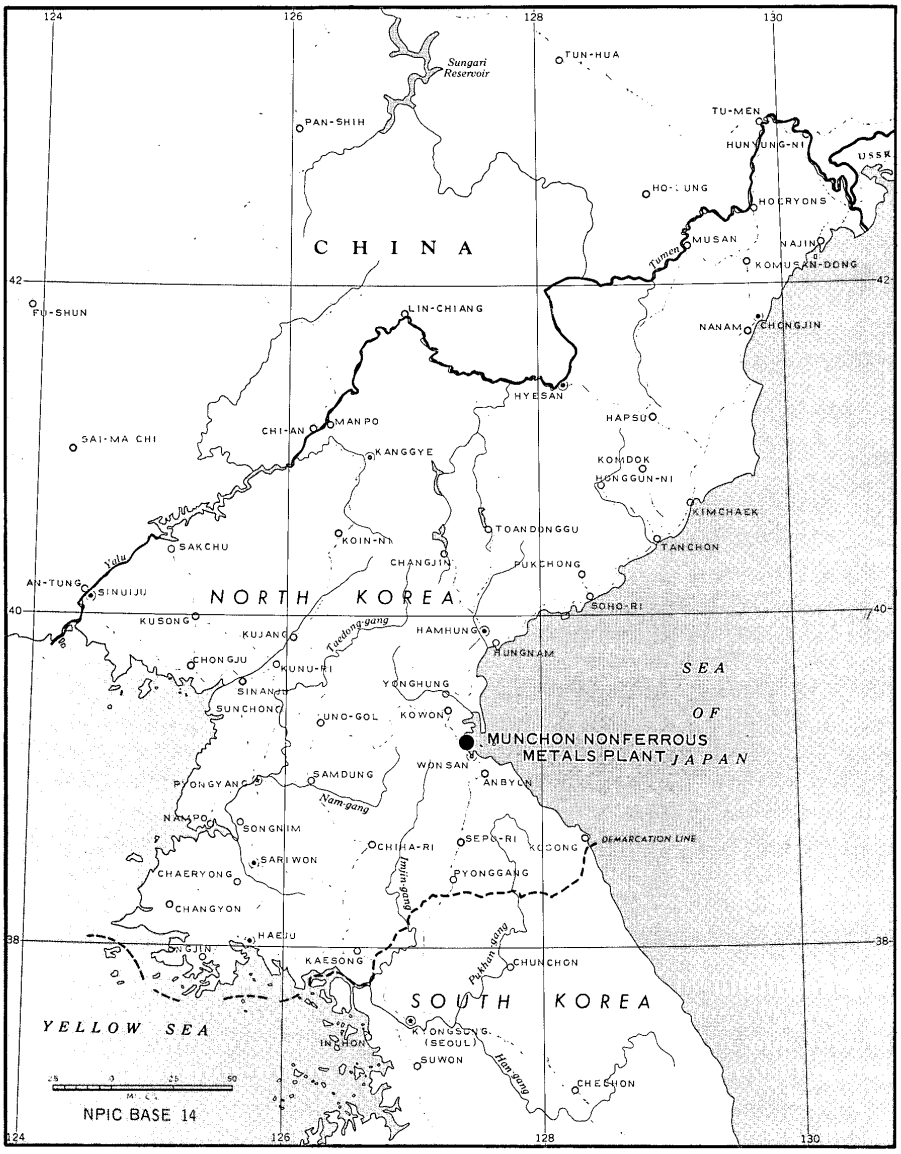

FIGURE 1. LOCATION MAP.

INTRODUCTION

The Munchon Nonferrous Metals Plant is approximately 1 nautical mile (nm) north of Munchon, Kangwon-do Province, North Korea (see Figure 1). It is probably the major producer of refined zinc, refined lead, and lead bullion in North Korea.

The plant is served by a rail spur from the main line between Kowan and Wonsan. The zinc and lead ores are brought in by rail from the nearby mines. There are facilities for loading and unloading small coastal vessels on the Sea of Japan, immediately east of the plant.

Electric power is probably supplied to the plant from the town of Hungnam, approximately 37 nm to the north. No associated plants or installations are observed in the immediate vicinity of this plant.

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BASIC DESCRIPTION

Physical Features

The nonferrous metals plant occupies a rectangular area approximately 4,000 by 2,500 feet which contains about 230 acres (see Figures 2 and 3). Only the western boundary of the plant is secured by a fence. Small streams provide a means of security along the north and south sides of the plant, and the Sea of Japan forms the eastern boundary. Except for the lead smelter, which is on a small hill in the center of the plant, the production facilities are in flat-lying areas.

Operational Functions

The major plant facilities are a zinc refinery, a lead refinery, a lead smelter, zinc and lead ore roasting units, sulfuric acid units, a zinc oxide facility, and precious metals recovery units.

Zinc sulfide ore is brought in by rail to Area E where it is roasted, leached, and then refined by the electrolytic process. The gases driven off during roasting are used for the production of sulfuric acid by the contact process in Area F. The sulfuric acid is used in the leaching and in the electrolyte solution.

Lead sulfide ore is brought into Area B by rail for preparation before it is roasted and smelted in blast furnaces in Area C. Some of the lead bullion is further refined by the electrolytic process in Area D. Limestone, which is used as a flux agent during smelting, is crushed and ground in Area B.

Zinc oxide is produced by the Waelz process in Area E and by the slag fuming method in Area C. Sulfuric acid is produced as a by-product from the zinc oxide facility in Area E. Precious metals, such as gold, silver, and platinum, are obtained as by-products from the residues at the two electrolytic cell buildings in the zinc refinery.

Construction Chronology

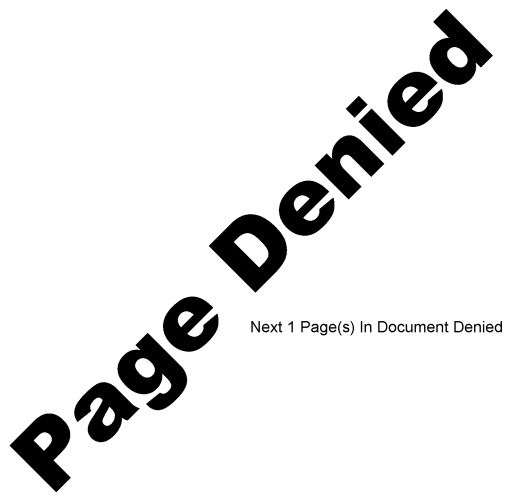
Major portions of the lead smelter and refinery at the plant predate the Korean conflict of the early 1950's. When covered by overhead photography in late 1962 major portions of the zinc production facility were also complete.

From 1962 to 1969 expansion of the zinc production facilities continued at a steady pace, and in June 1969 construction activity was still observed. During this period a new zinc oxide facility, two sulfuric acid facilities, by-product recovery facilities, and numerous support facilities were constructed. The chronology of this construction is shown in Figure 3.

Operational Status

In November 1962, when the plant was first observed on photography, all of the existing facilities appeared to be operational. Vapor was being emitted from the large stack associated with the lead smelter.

The by-product recovery facilities in Area G first appeared operational in January 1966. The adjacent zinc oxide facility (Waelz process) was first seen in operation in March 1968. The two new sulfuric acid facilities were probably operational when complete in September 1964 and March 1968. All of the plant facilities appeared to be in operation on all photographic coverage after they were first observed in operation.



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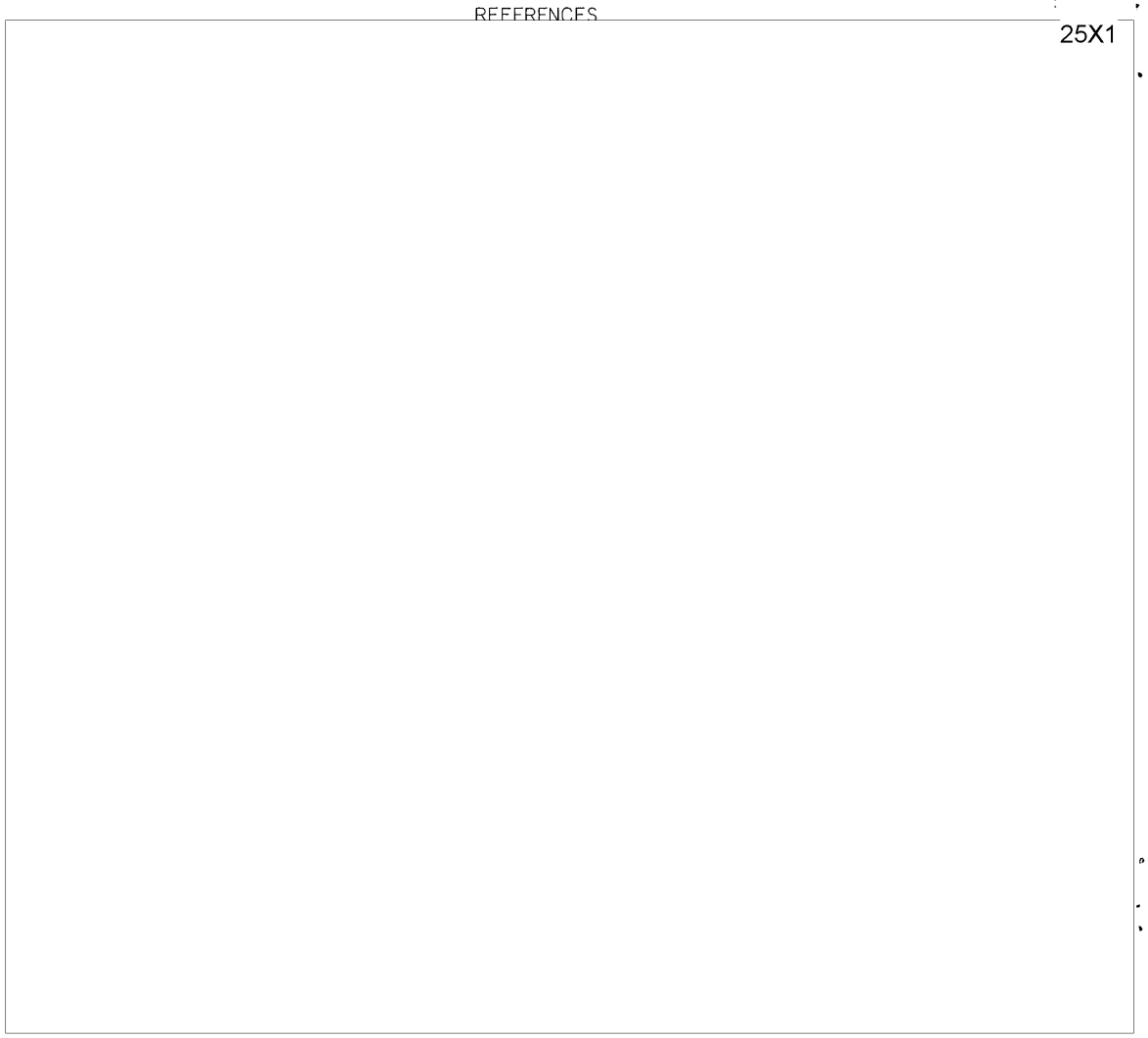

Map

548th RTG. US Air Target Chart, Series 200, Sheet M0380-4HL, 4th edition, April 1968, Scale 1:200,000 (SECRET/

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Requirement

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Support No.

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